

**CALL FOR PAPERS**  
**The 2019 U.S. WORKSHOP on the PHYSICS**  
**and CHEMISTRY of II-VI MATERIALS**

November 18 – November 21, 2019  
Embassy Suites Lakefront, Chicago, IL  
<http://www.ii-viworkshop.org>

**II-VI Detector Materials Special Sessions**

- IR
- UV
- Gamma-Ray
- X-Ray
- Photovoltaic
- CdZnTe
- HgCdTe
- ZnO
- ZnS
- History of IR Detectors
- Superlattices: II-VI and III-As/Sb
- II-VI Based Solar Cells
- Alternatives to CdZnTe Substrates
- HgCdTe Avalanche Photodiodes
- X-Ray and Gamma-Ray Detectors
- Surfaces and Interfaces
- ZnO Materials and Devices
- Defects and Doping
- Surface Passivation

**Participating Agencies**

U.S. Army RDECOM CERDEC Night Vision & Electronic Sensors Directorate  
U.S. Army Research Laboratory  
U.S. Army SMDC  
U.S. Navy Electro-Optics Center  
Penn State University  
Office of Naval Research  
Air Force Research Laboratory  
Army Research Office  
The Minerals, Metals & Materials Society  
Endorsed by  
The American Physical Society

**2019 II-VI WORKSHOP**

***Purpose***

The purpose of this Workshop is to bring together the industrial, governmental, and academic communities that work with II-VI materials. These II-VI materials are critical in a wide range of detector technologies operating in the infrared, ultraviolet, x-ray, and gamma-ray regions of the spectrum, as well as broad-band devices such as solar cells. They include HgCdTe, ZnSe, ZnO, ZnS, and CdTe, as well as other II-VI semiconductors and alloys. Spectrometers, imagers, and other sophisticated systems exploiting various properties of these materials are finding applications in many fields, including national security, homeland security, medicine, industrial process monitoring, basic science, astronomy, energy production, and more. The Workshop aims at advancing the understanding of the basic physics and chemistry of these materials, and thereby contributes to the continual improvement of these system capabilities.

The 2019 Workshop is the number 38th in a series that began in 1981.

### ***Areas of Interest***

Areas covered include a broad range of disciplines and materials properties. Included are materials growth and characterization, materials engineering, intrinsic and extrinsic defects and dopants, surface chemistry, fabrication processes, electrical properties and modeling, charge transport, noise sources, optical properties, photorefraction, electro-optical and magneto-optical properties, as well as the interaction among all these.

### ***Workshop Format***

The Workshop program will consist of about 60 oral presentations and possibly a poster session. Invited and contributed papers with a common theme will be grouped for presentation.

To provide ample time for discussion, there are scheduled morning and afternoon breaks. Lunch will be provided, affording additional discussion time. To further promote informal discussion and interaction, the first day will conclude with a wine and cheese reception accompanied by tabletop displays from commercial vendors displaying products and services of interest to the Workshop community.

Authors of accepted papers are encouraged to submit full-length manuscripts, which will be peer reviewed and published as part of the Workshop proceedings in a Special Issue of the Journal of Electronic Materials.

Student participation is strongly encouraged. An award recognizing the best student paper will be presented at the conclusion of the Workshop. Funding exists to support student travel to the Workshop. Some student financial assistance is available for conference attendees.

### ***Tutorial***

This year the II-VI Workshop will feature a tutorial section on Monday, November 18. The tutorial will be given by Dr. William Radford and Dr. Chad Fulk of Raytheon Visions Systems. The tutorial welcomes all interested and registered U.S. II-VI workshop participants. The workshop committee particularly encourages graduate students, post-docs and junior researchers to attend the tutorial and explore the topics in detail and tap into the experience of and network with the well-established researchers. More information about the tutorials such as topic, registration, time and location will be posted on the II-VI Workshop website and also distributed via email in following weeks.

### **Selected Focus Topics**

- Emerging Infrared Detector Technologies
- Multi-Band Detectors
- Near-Room-Temperature IR Devices
- HgCdTe Avalanche Photodiodes
- Material Growth and Modeling
- Substrates for HgCdTe: CdZnTe and Alternatives
- Structural Characterization
- Doping Issues in HgCdTe
- Radiation Detectors
- Solar Cells
- Integration of 6.1-Å II-VI and III-V Materials
- IR Applications of Plasmonics and Metamaterial

Several Invited speakers will present review talks on these topics. Check the Workshop Web site for updates.

### **Welcome Remarks**

Congressman Raja Krishnamoorthi

### **Keynote Address**

This year's Keynote Speaker will be Dr. Philip Perconti, Director of Army Research Laboratory.

### **Invited Speakers will include:**

**Oguz Altun**, ASELSAN

**Fikri Aqariden**, DRS

**James Beletic**, President, Teledyne Imaging Sensors

**Brett Breazeale**, Deputy VP/GM, Leonardo DRS

**Debashis Chanda**, Associate Professor, University of Central Florida

**Christoph Grein**, Professor, University of Illinois at Chicago

**Pierre Jenouvrier**, CTO, SOFRADIR

**Philip Klipstein**, Principal Investigator, SCD

**David Rhiger**, Raytheon Vision Systems

**David Ting**, Senior Research Scientist, NASA/JPL

**Jason Zeibel**, Deputy Director, NVESD

**Yong-Hang Zhang**, Professor, Arizona State University

## GENERAL TOPICS

The scope of the Workshop includes the basic physics and chemistry of all II-VI materials and their applications. Materials of interest include HgCdTe, HgCdSe, ZnSe, ZnO, ZnS, CdTe, and CdZnTe. Issues in the following critical areas are of interest:

- X-Ray & Gamma-Ray Radiation Detectors
- Radiation Effects in HgCdTe
- II-VI-Based Solar Cells
- Materials Growth and Characterization
  - Control of composition, carrier concentration, and lifetime
  - Modeling of growth and processing
  - Equilibrium and non-equilibrium growth
  - Defects and Doping
- Physics of Failure
  - Characterization, particularly non-destructive
  - Effect on electrical and optical properties
- P-doping issues in HgCdTe
  - Impurities
  - Diffusion
  - Activation and segregation
- Dislocations: generation mechanisms, properties, kinetics, characterization, mitigation
- Surfaces and Interfaces
- Etching, passivation, and metallization
- Modeling and Simulation
- Material properties
  - Growth and processing
  - Device physics
  - Characterization of Materials
  - Electrical, optical, and microstructural characterization
- ZnO and ZnS Materials and Devices
- Magnetic semiconductors
- 2D Materials
- Quantum Dots

## CALL FOR PAPERS

Papers describing significant advances in the state of the art of scientific results and understanding in the Workshop issues are solicited. Experimental results or theoretical results addressing experiments are encouraged. Emphasis should be on new fundamental physics and chemistry of materials for detector applications. Abstracts must contain results to be considered.

Papers will be selected on the basis of (1) originality, (2) significance of results, (3) quality and completeness of the research, and (4) breadth of interest. Extended abstracts of all accepted papers will be published in the Book of Extended Abstracts, which will be distributed at the Workshop. Submitted full-length manuscripts, after peer review, will be published in the Journal of Electronic Materials.

## WORKSHOP WEB SITE

(<http://www.ii-viworkshop.org>)

The Workshop Web page has the latest information on the Workshop and is updated as information becomes available.

### ABSTRACTS

1. Abstracts, suitable for publication, should clearly indicate the following:
  - a. original aspects of research
  - b. objective and approach of work
  - c. previous publications or presentations
  - d. experimental data
  - e. scientific implications of results
2. One-page abstracts should be double spaced on a single 8 1/2 × 11-in. sheet of paper. One (1) additional page of supporting figures will be accepted and is encouraged. The title, author(s), and affiliation(s) must be included.
3. A complete mailing address (phone, fax, and e-mail) of the presenter must be included.
4. Abstracts to be considered as student papers must be identified as such, and the name of the advisor must also be included.
5. Abstracts are to be submitted on or before **June 7, 2019**.

[Click Here to Submit Your Abstract!](#)

**Electronic abstract submission is required and should be submitted as Microsoft Word files or as PDF files.**

6. Foreign authors requiring a visa are encouraged to submit their abstracts as early as possible. Special consideration will be made to ensure that an early application for a visa can be made.
7. Authors of accepted papers will be notified by June 28, 2019. Authors of accepted papers are requested to submit a revised abstract, not to exceed four pages, for inclusion in the Book of Extended Abstracts by August 23, 2019.
8. Full-length papers for publication in the Workshops Proceedings in a Special issue of the Journal of Electronics Materials must be submitted electronically by using the link on the Workshop's Web page (<http://www.ii-viworkshop.org>).

The authors can submit manuscripts from November 1 – December 18, 2019.

### 2019 WORKSHOP CALENDAR

Deadline for Submission of Abstracts	June 7, 2019
Notification of Accepts/Rejects	June 28, 2019
Deadline for Late-News Abstracts	July 12, 2019
Deadline for Extended Abstracts	August 23, 2019
Hotel Reservation Deadline	October 16, 2019
Workshop Registration Deadline	November 1, 2019
JEM Paper Submission Deadline	November 1 – December 18, 2019
2019 II-VI Workshop	November 18 – November 21, 2019

## **WORKSHOP ORGANIZATION**

### **CO-CHAIRS**

Sivalingam Sivananthan, University of Illinois at Chicago  
Pradip Mitra, Leonardo DRS, Electro-Optical and Infrared Systems (EOIS),  
Dallas, TX

### **PROGRAM COMMITTEE**

Tony Almeida, Army NVESD  
Jose M. Arias, CACI / U.S. Army RDECOM CERDEC (NVESD).  
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Ishwara Bhat, Rensselaer Polytechnic Institute  
Arnold Burger, Fisk University  
Joseph Burns, Air Force Research Laboratory  
William Clark, Army Research Office  
Roger DeWames, Army NVESD  
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## **WORKSHOP PARTICULARS**

### ***Location and Date***

The 2019 II-VI Workshop will be held on November 18 – November 21, 2019 at the Embassy Suites Lakefront, 511 North Columbia Drive, Chicago, IL 60611.

### ***Registration***

The Workshop Registration Form will be available in June 2019. Registration fees are not yet set so please check the Workshop web site periodically for updates.

The deadline for Workshop early bird discount registration is November 1, 2019.

### ***Hotel Accommodations***

A block of rooms has been reserved at the Embassy Suites Lakefront Hotel at special Workshop rates. A limited number of rooms will be available to Government employees and university staff/students with proper identification. More information on making hotel reservations will be available on the Workshop Web site in the coming months. Please check the website frequently for updates. Reservations received after the cut-off date of September 16 will be subject to availability.

### ***Student Financial Assistance***

To help defray the cost of attending the Workshop, full-time students presenting papers will receive partial support of their travel expenses. This support must be requested in advance of the Workshop.

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